

ABSTRACT

Title of Thesis: MACHINAL: LIGHTING DESIGN AND
RESEARCH IN THE DIGITAL
PERFORMANCE ERA

Jacob A. Hughes, Master of Fine Arts, 2021

Thesis directed by: Visiting Professor, Andrew R. Cissna,
School of Theatre, Dance, and Performance
Studies

The purpose of this thesis is to provide research, supporting paperwork, and production photographs that document the lighting design process for the University of Maryland - College Park, School of Theatre, Dance, and Performance Studies' production of *Machinal* written by Sophia Treadwell and its transition from the original stage design to its virtual production. This thesis contains the following: research images collected to develop and visually communicate ideas about color, texture, intensity, form, composition, and mood to the production team; preliminary and final organization of desired equipment to execute the lighting design, and drafting plates and additional paperwork used to communicate the organization and placement of lighting equipment to the master electrician. Archival production photographs and photographs of various spaces used by performers are included as documentation of the completed design.

MACHINAL: LIGHTING DESIGN AND RESEARCH IN THE DIGITAL
PERFORMANCE ERA

by

Jacob Andrew Hughes

Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Master of Fine Arts
2021

Advisory Committee:

Visiting Professor, Andrew R. Cissna, Chair

Associate Professor, Brian MacDevitt

Associate Professor, Jared Mezzocchi

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Acknowledgments

I would like to thank my mother and father, with whom I stayed for five months and made a mess with taking apart lights, Andrew Cissna for being a great mentor and leader during all this chaos, and friends who I could call up to vent and spill the beans.

I would also like to thank my collaborators and co-creators.

Director: Brian MacDevitt

Choreographer: Kendra Portier

Associate Director: Fraser Stevens

Media Designer: Devin Kinch

Costume Designer and Best Roommate Ever: Madison Booth

Scenic Designer: Rochele Mac

Sound Designer: Roc Lee

Wig Designer: Austin Blake Conlee

Stage Manager: Maria De Barros

Dramaturg: Lindsey R. Barr

Production Manager: Jenn Schwartz

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Chapter 1: Pre-Production of the Stage Show

1.1: Conflict statements

In a pressurized and money-driven world, a young woman struggles to find herself and her place in the "great machine". She stuffs herself into the tight frame that her mother and peers demand of her. She meets a carefree charming man, unlocking her mental chastity belt from enjoying life. When he travels on to the next big adventure, she is placed back into the domestic lifestyle's mental corset, and in a pulse of emotion and longing for freedom, she kills her husband. She is found guilty after admitting she murdered her husband, and we follow her journey to the execution.

Before our first official design meeting, the Director for *Machinal*, Professor Brian MacDevitt, called all the designers and asked them to prepare a statement about the conflict in the play and what each person sees as the show's driving force. My conflict statement explored the young woman's struggle with her identity and her fight to be herself versus the suffocating pressures of societal norms. Each designer read their statement aloud in the production meeting and the scenic designer, Rochele Mac, pointed out that what the young woman experiences is a type of panic attack. This idea would later become the foundation for dance, scenic, and lighting gestures. At the end of the production meeting, the design team received the task to respond to the director's vision of "a field of flowers" for Episode Six: Intimate. Brian proposed to the design team that he envisioned the young woman and the man in Episode Six: Intimate to be "in a field of flowers", not literally but emotionally in that scene; the

woman feels free from the pressures of her mother, husband, and child. The ideas for this ranged from the imagery of flowers to the feeling of flowers in a striking way to the design team. The Associate Director, Fraser Stevens, scheduled a meeting with the design team to discuss exciting options and ideas. He suggested the field of flowers could simply be “What is Brian's happy place?” I understood Fraser's take on how Brian interpreted the Young Woman, but I had to research more on what this meant dramaturgically. I took note wanting to explore what the happy place of the Young Woman could be. The script referred to the young woman wanting to see and hear the ocean:

Young woman: I thought you said there'd be a view of the ocean!

Husband: Sure there is.

Young woman: I just see people – dancing.

Husband: The ocean's beyond.

The young woman (desperately): I was counting on seeing it!

(Treadwell, *Machinal* 22; Episode Three: Honeymoon).

Man: You're awful still, honey. What you thinking about?

Woman: About sea shells. (The sound of her voice is beautiful.)

Man: Sheshells? Gee! I can't say it!

Woman: When I was little my grandmother used to have a big pink sea shell on the mantle behind the stove. When we'd go to visit her they'd let me hold it, and listen. That's what I was thinking about now.

(Treadwell, *Machinal* 45; Episode Six: Intimate).

Dramaturgically I analyzed these quotes, and I pondered about this for a few days, then explored research into water refraction art installations, underwater photography, and similarities in how light and water can pour from a source. Brian mentioned to me in the first production meeting to research James Turrell. I dove into James Turrell's work and his excellent use of light to create bold shapes and blocks of defined light and darkness. I wanted to avoid his use of saturated light in his installations because the lighting and scenery being in black and white will allow the costumes and media to carry the color. I discovered some exciting imagery of a water installation and its interaction with light that also brought a personal experience from an exhibit at the Hirshhorn Museum, Rafael Lozano-Hemmer's Pulse series.

One of Lozano-Hemmer's pieces, *Pulse Tank*, was a simple table of water with a single point of light aimed at the table in a slight degree, causing the light to reflect off the table and onto the wall opposite of the room. The viewer of the piece places their hands on a heart rate reader, and their heartbeat is translated into pulses on the water; across the room, the light reflecting off the surface of the water bends and contracts. For me, there was a sense of awareness of my breath and how my vitals affected the environment of the room. I related this idea to the young woman and her longing for the ocean and control of her breath. I pursued linking lighting elements of water to the woman's longing for the ocean and the differences between still and moving water reflections. Following our initial statements and conversations, I developed these research image plates. (Figures 1 through 5)

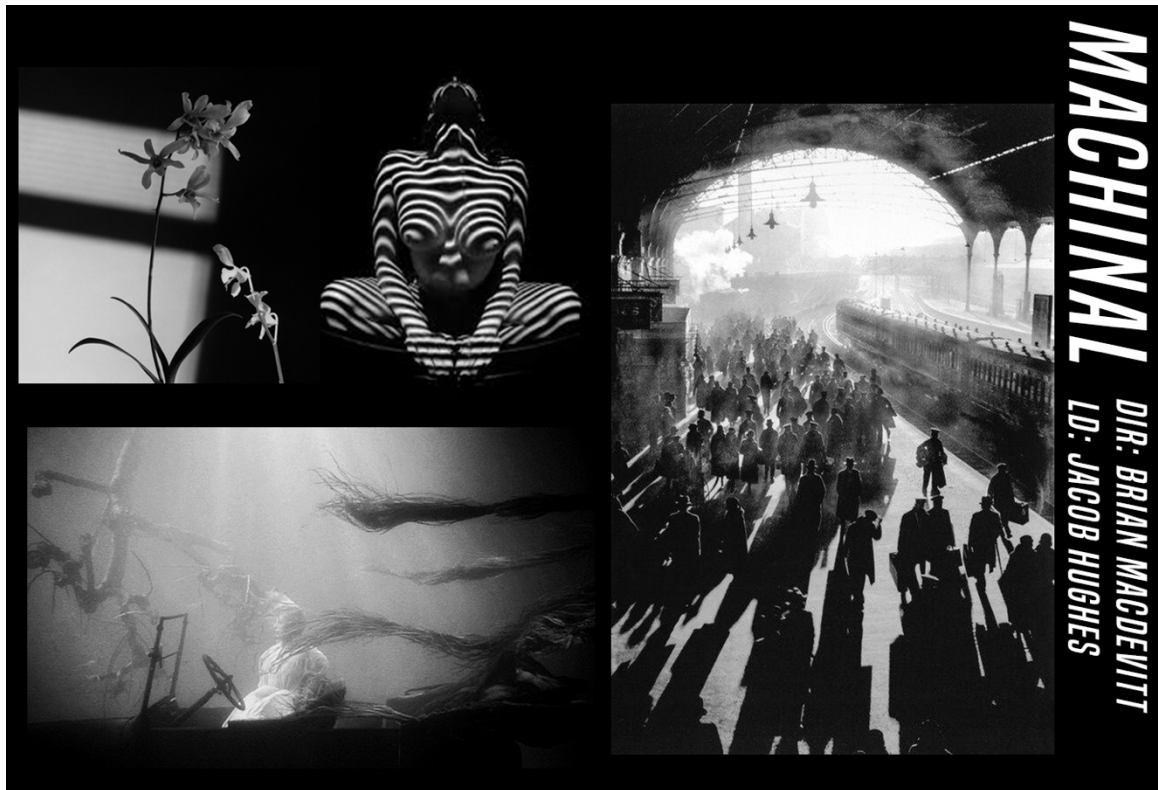


Figure 1: Film Noir Lighting

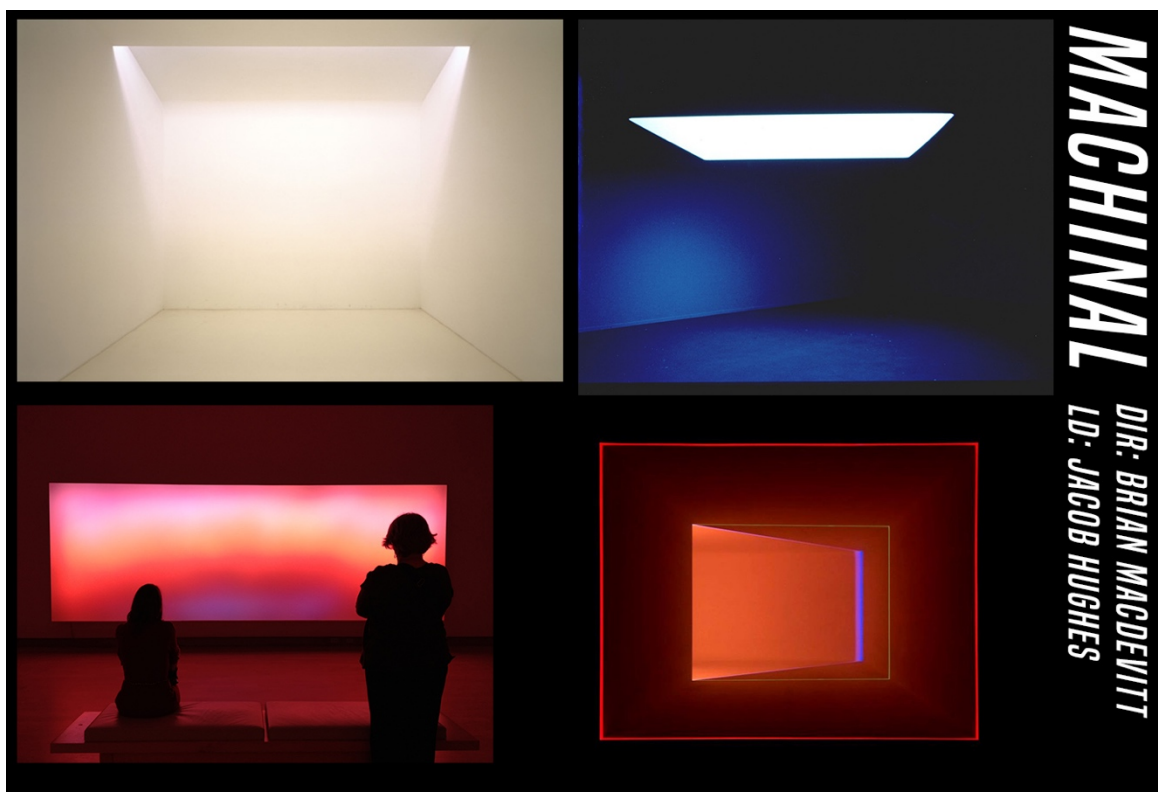


Figure 2: James Turrell; Blocks of Light and Light Pouring

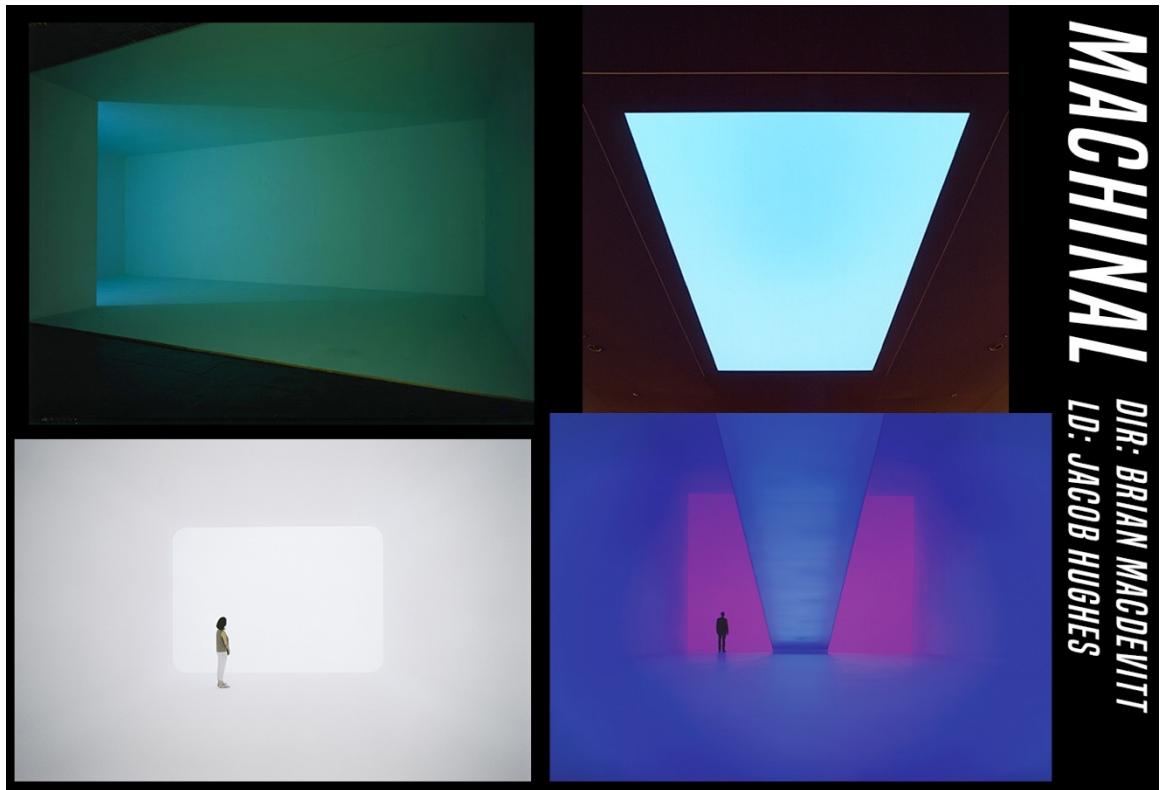


Figure 3: James Turrell; Continued

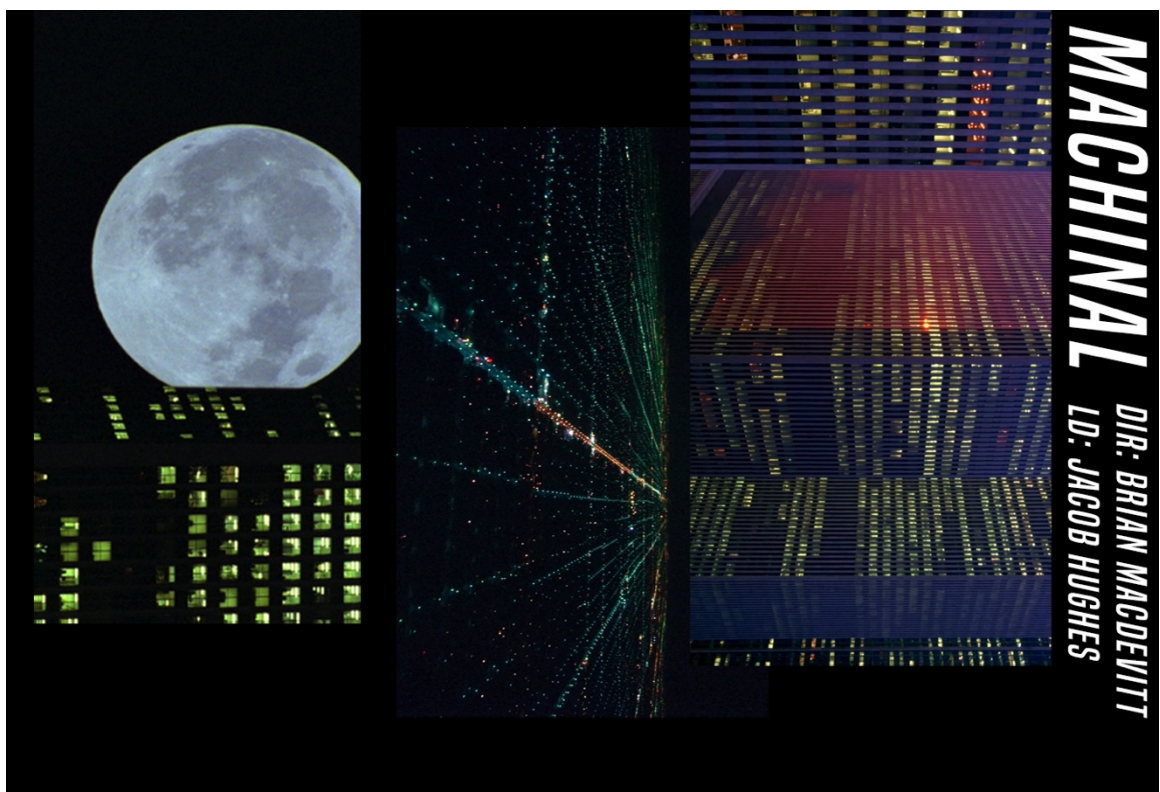


Figure 4: Koyaanisqatsi; City at Night

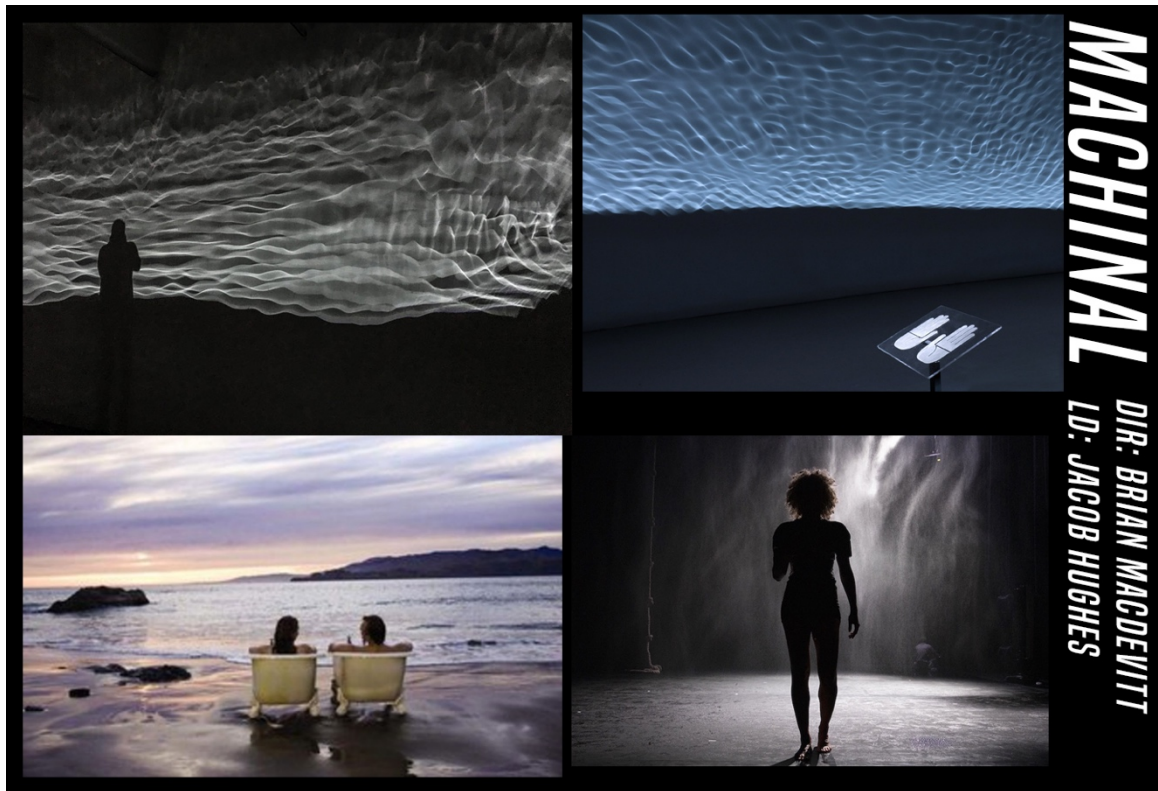


Figure 5: Water Research; Ripples and Color Ideas

1.2: Design Conversations Post Concept Meeting

Between the Concept and Research meetings, the design team met again with Brian, Fraser, and Lindsey Barr, the play's dramaturg. Brian worked through the show and discussed possible ideas in each episode. In this meeting we discussed the idea of having a period show and mixing in contemporary elements. Honestly, this relieved the pressures of staying historically true to the environment the script described and allowed us to modernize the play and explore more out of the box ideas.

The costume designer, Madison Booth, presented the concept of body modification for the husband and office workers. This felt right in seeing how the young woman viewed her husband and was disgusted by his small hands. Brian explored with scenic and lighting the notion of perpetual motion and "a city moving." Brian had a dance at the beginning of the show, which we referred to as the prologue. He purposed the idea of the prologue taking place in a subway as a precursor to Treadwell's story showing why the young woman escaped the subway. I latched onto this proposal because Brian was asking the design team to think big and explore. I then thought back to Rochele's statement on how the young woman is experiencing panic attacks.

At one point in the meeting, there was talk about how a building in the scenic designer's research looked "phallic" and how it highlighted that the society in the play is a "man's world." This led to conversations about the theme of human verses nature and trying to find moments of breath and air in the man driven world. Brian gave me emotional and visual feedback about my research. He felt a James Turrell image of an all-white room with a woman in it needed an element of nature (figure 3). I agreed with Brian after he explained his point of view of the Young Woman and we came to

the conclusion lighting could be used for breath and panic. I achieved by this tying the slow controlled breathing moments into expansive light and in moments of pressure and panic lighting could be tight, sharp, and constricting. From my first research plate, Brian vibed with the square boxes of light being an element of oppression in the show (figure 2 and 7). He asked Rochele to include this large lightbox in her scenic design to achieve this look. In his idea for the prologue dance, the box of light lowered onto the young woman to highlight her psychological state and her need to break out of her situation. This inspired me to move further into research for the prelim phase of the design process.

1.3: Into Prelims

Prelim is a phase in the design process in which the design team presents their current standing on the design of the show as a whole to the Director and production team. In our prelim meeting that the idea for water ripples, water imagery, and city lights did not match the direction the director, scenic designer, and media designer developed in a side conversation. I was disappointed the conversation happened without me and was irritated being told what to do lighting wise rather than be a part of the conversation. I decided to drop the idea of the city building lights and water reflections. I kept the picture of a comforting atmosphere in my pocket, an image taken from a film noir movie, *The Night of the Hunter*. This image was the real spark behind what could be an ethereal feel (Figure 1). Brian previously discussed loving the imagery of the woman underwater and the eerie beauty of the staging. I thought it was lovely to create an ethereal feel in Episode Six: Intimate.

We decided to have a white flowy drop come into the space and, with the use of media, project the actors onto the drop. I felt that lighting could further place this scene into its etherealness by matching the stage's breath to the drop's graceful flow (Figure 6). To make the ethereal feeling, I started researching Svoboda lights. From historical images of Svoboda's stage designs, he created beautiful walls of light with a series of small single source lights layered together in two rows. I was interested in creating a shimmering wall of light by using a similar setup to Svoboda but control the individual lamps to create movement in the atmosphere of the ethereal world we were placing Episode Six: Intimate and the end of the show.

At the end of our Prelim phase, Brian reacted positively to my wall of fluorescent light research (Figure 9). This included tubes of light being a form of

movement with a series of intensity changes to give the illusion that a subway was moving. He requested the scenic designer to incorporate this idea into the stage design. This process now felt like I had a more substantial influence on the show and that I would be included in more discussions moving forward with such a lighting practical presence.



Figure 6: Rendering of the actors projected on to the white drop. Scenic Rendering from Rochele Mac.



Figure 7: Edits to Research Reference; Light Squares and Beams

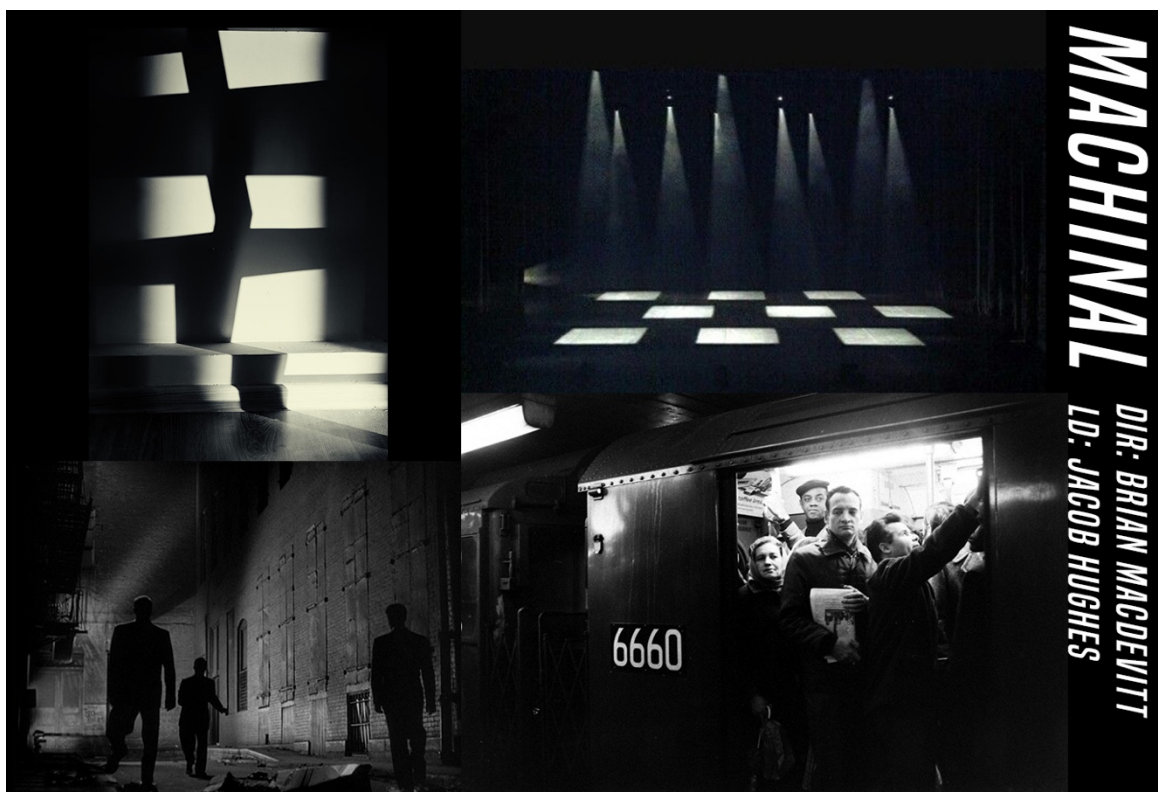


Figure 8: Edits to Research Reference; Blocks of Light

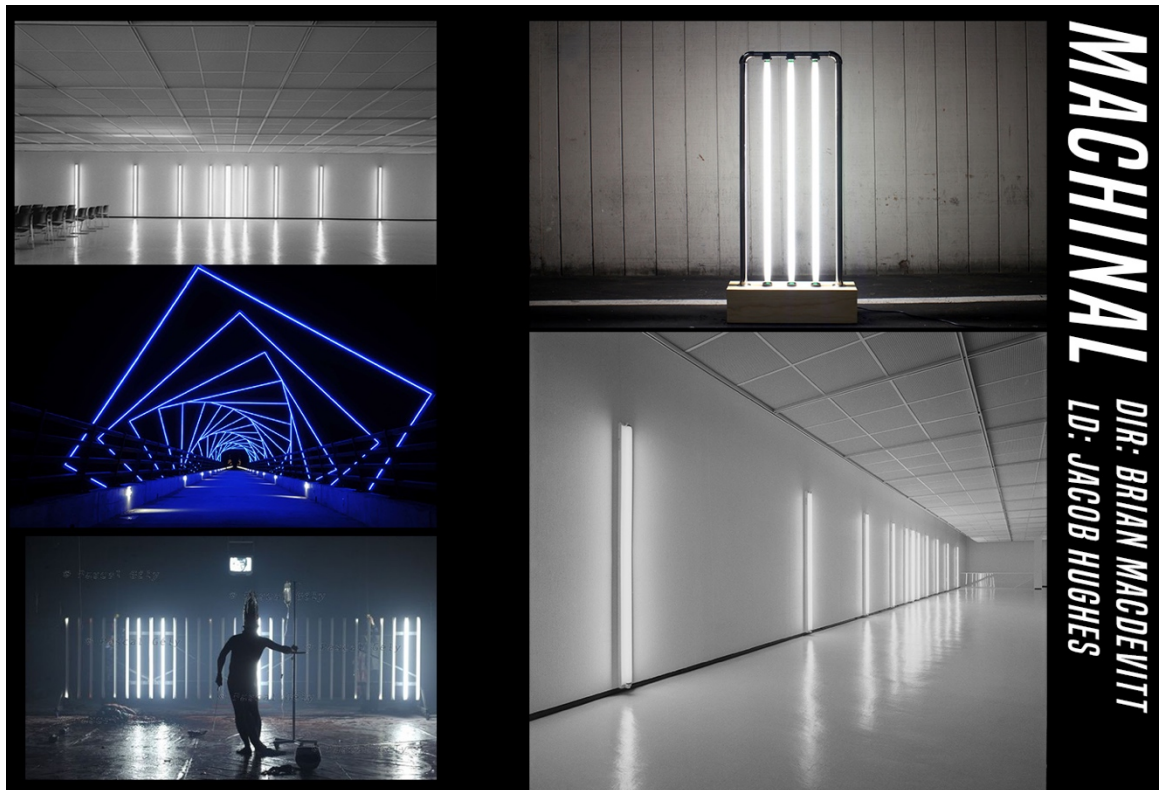


Figure 9: Edits to Research Reference; Fluorescent Tubes and Bars of Light

1.4: Design Finals Meeting and Cost out

During the planning of *Machinal*, I worked under lighting designer Sarah Riffle at Des Moines Metro Opera. I had a conversation with her in the process of planning for her opera, *The Queen of Spades*. She wanted to pursue using an HMI light with a douser for part of her opera. I was not too familiar with HMI lights at the time because I've never used one myself. After researching the instrument, I quickly discovered that an HMI Fresnel was perfect for achieving the end of *Machinal* look with the young woman walking into an ethereal realm of haze, fog, and light. It was the right color temperature, intensity, and its distribution was fantastic in how smooth the intensity was even. I was adamant about incorporating this into my final design.

At this point in the process, all the designers were closer to the final design decisions of the stage show for *Machinal*. Ideas for scenic, costume, media, and lights are now up for discussion to see if the show is affordable. Rochele included in her scenic design over 250 feet of fluorescent tubing varied sizes that were not standard. Simultaneously, everyone was in week three of quarantine from the start of the COVID-19 Pandemic. We discussed labor shortages, lack of budget, and other factors affecting the production because of COVID. Brian envisioned using a particular dimmable lighting fixture he used on Broadway for fluorescent tubes. The electrics shop also expressed going that route for the benefit of 10-volt dimming, I was annoyed that I was being pressured into something expensive just because it would mean one less wire had to be run to the units. Cost-wise, they did not fit the budget for the show, and I felt their size was not suitable because of their small lengths. Rochele drafted tubes that were not of standard size, however compositionally they were stronger not being the same length. At that moment, the

cost per foot for this idea was too much for the show's budget, and I needed to look for a new way to keep this idea on the table. I used my time to research a way to keep this idea affordable so that we could execute what Rochele had drafted. At some point, to get out of the house, I ended up purchasing the product Brian recommended to understand what Brian envisioned fully. I dismantled it to see how it functioned and ended up learning the construction was very simple. What gave the product its look was the half-round diffusion cover. I went down a rabbit hole of wholesale architecture lighting, and I discovered an exciting solution that was a round polycarbonate LED diffuser tube that matched the look of a large fluorescent tube. I was fortunate enough for the company to send me samples of the product to confirm that it was perfect for the show in creating achievable fluorescent tubes. This is important because I was able to learn how to better research what I envision lighting-wise directly from a tangible product. This influenced me as an artist and my process to explore tangible fixtures and not just images. Attached below was the final equipment request for *Machinal* before the summer break (Figure 10).



LIGHTING EQUIPMENT REQUEST
UNIVERSITY OF MARYLAND
TDPS: *MACHINAL*
LIGHTING DESIGNER: JACOB HUGHES
hughesjacob@hotmail.com
469.867.2138

Version 2: 04/10/2020
Final Design Meeting

Producing Company and Billing Info:
University of Maryland:
School of Theater, Dance,
and Performance Studies
8270 Alumni Dr. College Park, MD 20742

Venue:
The Kay Theater
The Clarice Smith
Performing Arts
Center
College Park, MD

Date:
Opening Fall 2020

Quantity	Item	Description	Unit Price	Total
Atmospheric Effects				
2	Hazer	Unique 2.1 Hazer		
1	Fogger	TBD -House fogger		
Lighting Equipment Requests				
1	10k HMI Fresnel	10k HMI Fresnel with dowser, tbd		
18	GLP X4 Atoms	GLP X4 Atoms in the 6 unit track		
18	Pin Spots	House Pin Spots		
Lighting Practicals				
TBD	Florescent Tubes	Florescent Tubes, 4' to 8' lengths, single units, TBD with Scenic Designer.		
TBD	Lamp Practicals	Lamps that are set dressing, TBD.		
4	Light Box Tables	LEDs lights mounted into a small trough to create uplight.		
Additional Hanging Positions				
	Truss over the Apron	A truss position similar to what was used in <i>The Visit</i>		
-	Kay inventory	Full access to Kay inventory		

NOTE: THIS DOCUMENT IS NOT A FULL RENTAL LIST. IT IS EXPECTED THE SHOP WILL ADD THINGS NEEDED TO MAKE A COMPLETE WORKING SYSTEM. THIS INCLUDES ALL RIGGING PIECES.

Figure 10: Lighting Equipment Request v2

Chapter 2: Pre-Production of the Virtual Show

2.1: Design Experimentation for the Camera

The School of Theatre, Dance, and Performance Studies changed its season in response to COVID-19. *Machinal* was moved to be a live-streamed performance with the actors staying in their homes. The original performance dates were adjusted for the design team to have a semester to plan for the changes in the new show format. Towards the end of September, the design team convened with Brian and Fraser to discuss how we would move forward into the digital era of performance. At the same time, Devin and I were in THET 669W: Devised Work Collaboration taught by Brian MacDevitt. Devised Work Collaboration is the foundation of *Machinal*'s transition to the live stream realm. In class, we experiment with storytelling visuals, using miniatures sets and projecting live video content of a model onto a screen for performers to interact with storytelling-wise. As a design and directing team, we are excited about this and the way we brought the performers back into the theater despite being miles apart. The next challenge for *Machinal* developed into "How do we bring the feel of theater to the video platform?".

In his exploration, Devin placed the actors in the space further with roughs of the existing *Machinal* scenic design while chroma keying cutouts of a performer, then setting the performer into a 3D world he created. When Devin was pitching this idea, he said I could add in a 3D light plot into the computer-generated world and control lights in the virtual world. The 3D computer model brought up the discussion about the quality and feel of the video content. Brian felt the quality Devin presented took away from the theatricality of the performance. Rochele and Devin discussed

solutions and proposed an idea using the Pepper's Ghost technique. Using a model box and scrap plexiglass we played with streaming a performer onto a ¼" model, I brought various types of lights to figure out how to illuminate the model without bleaching out the performers (Figure 11, Figure 12, and Figure 13). The demo was successful, and all the designers were on board with the idea. The final verdict into prelims for this new process was to use a ½" model and videotape parts of the model for the actors to perform on top of. Chosen moments in the show used a live stream of the model with the performers projected in with the Pepper's Ghost technique. This meant I now needed to create a lighting design and plan for a ½" model.

At the same time as the development of the Pepper's Ghost technique, I worked on ways to light the actors at home. I peeked into the idea of using Philips Hue bulbs I had used on a previous show and the possibility of controlling light in the performers' home remotely. This idea was quickly scrapped because of end costs and reliability. I wanted to keep my original design intentions from the staged show into the virtual play we were creating. Over the summer before this process, I started photography as a hobby and used home depot clip lights with gels to take photos. It was an affordable way to light my subjects. I experimented using my laptop camera, a green screen, and the home depot clip lights in recreating creating my research images (Figure 14 through 19). It was moderately successful in sculpting the subject while learning from this test the significant delay in the camera's timing on adjusting its exposure. Devin was not worried about the camera's adjustment time, more so concerned about the illumination of the green screen. Time was of the essence with

decisions and getting equipment to the performers with the worry of school shutting down because of COVID numbers.

We were moving into the first cost out for *Machinal*. I made a fully functional set up of what I envisioned the performers receiving and experimented with various looks I could achieve with five lights. During this testing, I would use Zoom's built-in chroma key with a single light illuminating the green screen, and there was no significant keying issue visible in my feed. From these tests, I moved forward with the shops on purchasing and distributing the lighting gear. Below are images from the following; testing lights with Pepper's Ghost and of the at-home lighting kit setups (Figures 11 through 19), and paperwork sent to the electric shop for lighting kit information (Figure 20 through 22).



Figure 11: Pepper's Ghost Research: Green Screen for Chroma Keying

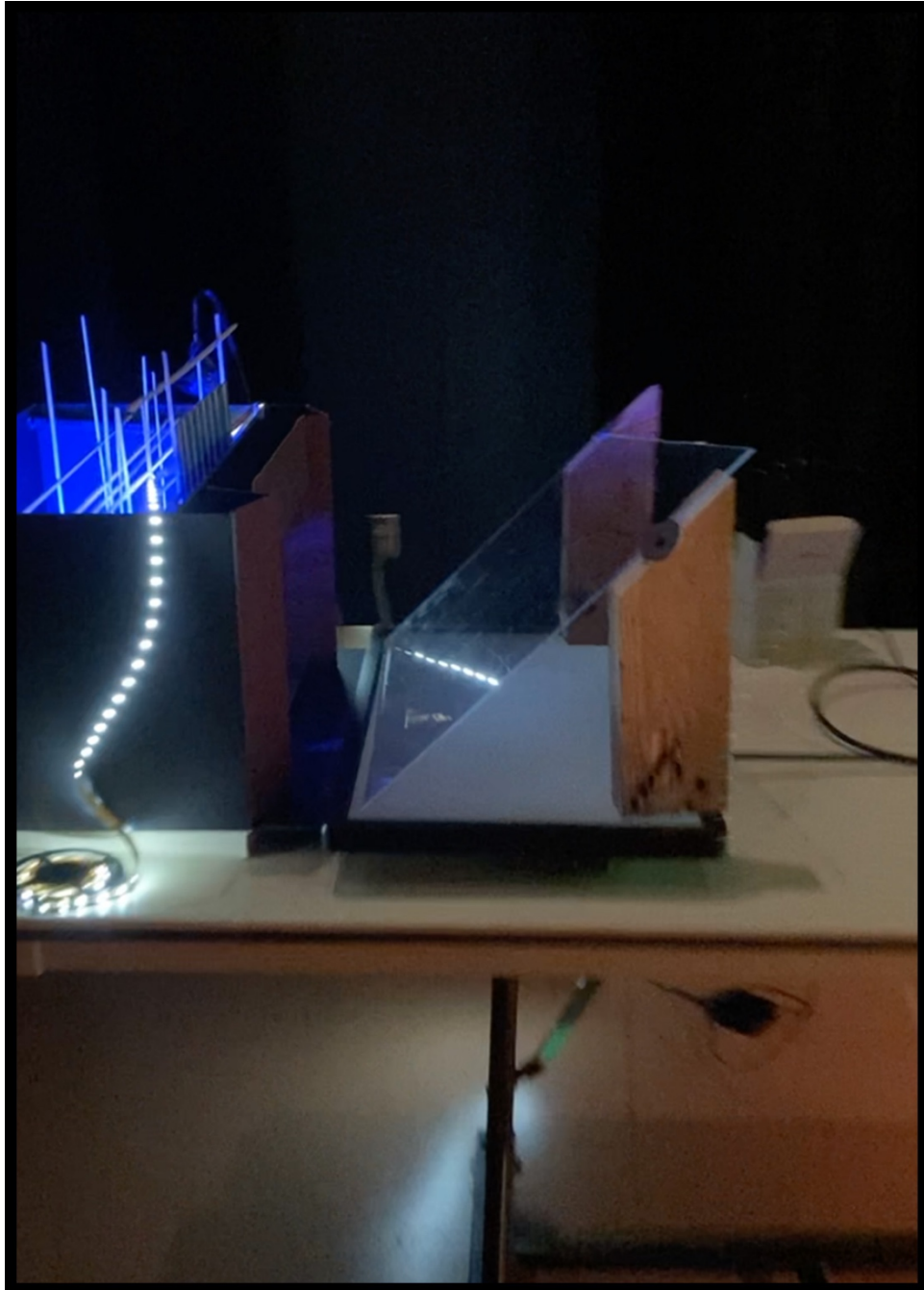


Figure 12: Pepper's Ghost Research: 1/4" Model with Plexiglass and LCD Monitor



Figure 13: Pepper's Ghost Research: Prelim Sample of the reflection



Figure 14: Lighting for Zoom: Side Lighting



Figure 15: Lighting for Zoom: Top Front Lighting

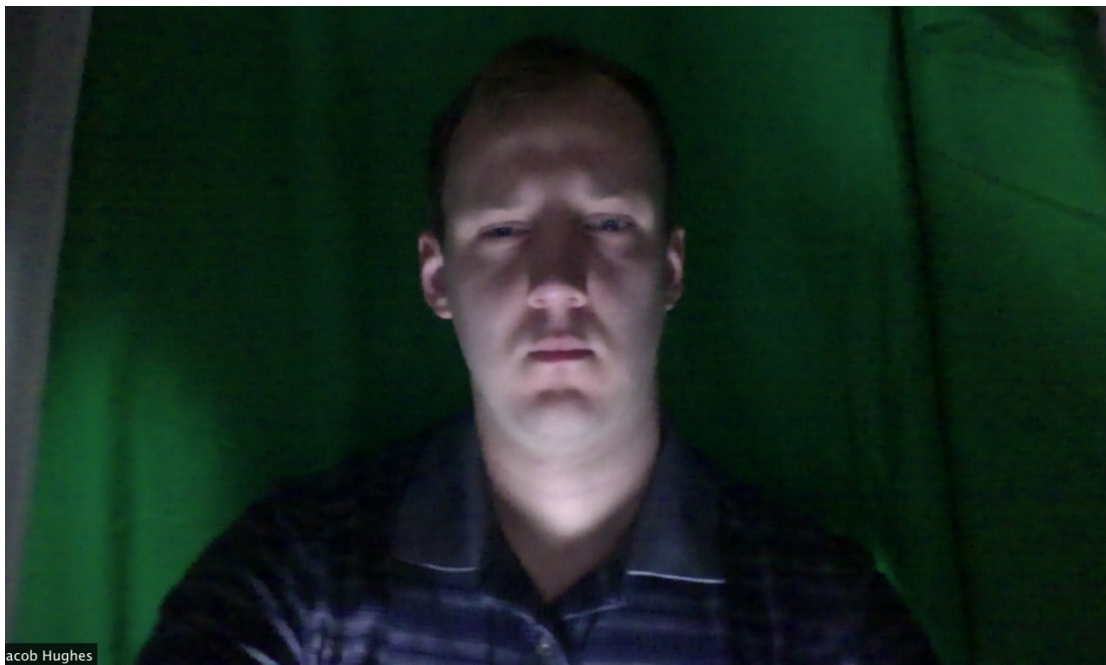


Figure 16: Lighting for Zoom: Underlighting, in this case, a footlight.



Figure 17: Lighting for Zoom: Experimented with overexposing the camera

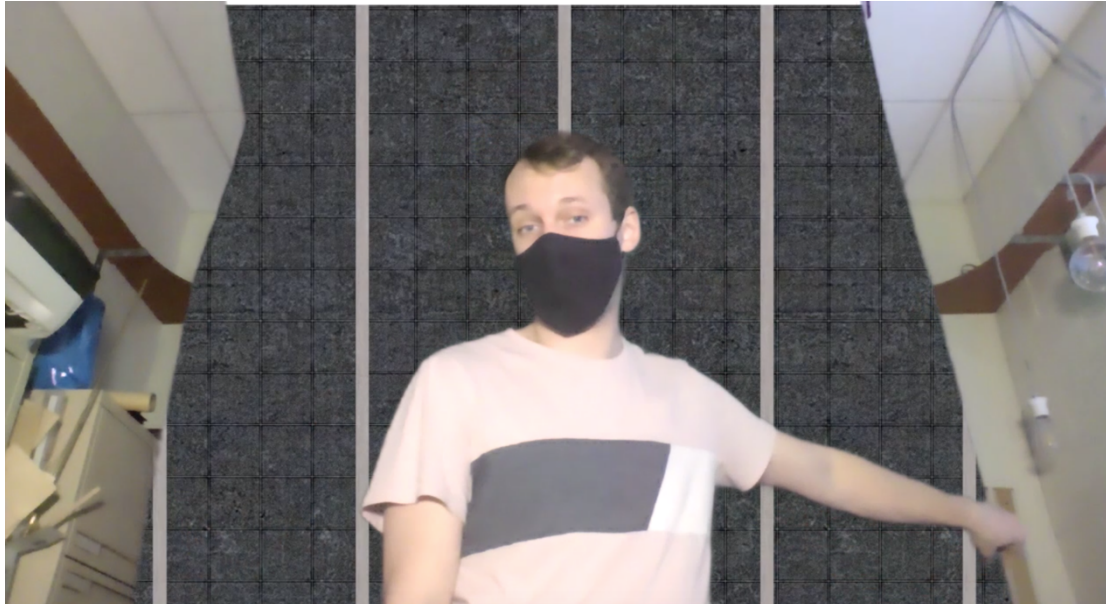


Figure 18: Lighting for Zoom: Experimented with the Chroma Key



Figure 19: Lighting for Zoom: Experimented with the Chroma Key

Machinal

Lighting Kit Action Plan

This document is to show how the power strips and plugs should be labeled and which light bulb goes into which clip light.

Ch# = Channel Number

 = Neon Orange


 = Neon Green

 = Neon Yellow

 = Neon Pink

 = Neon Blue

 = Red

 = Gray

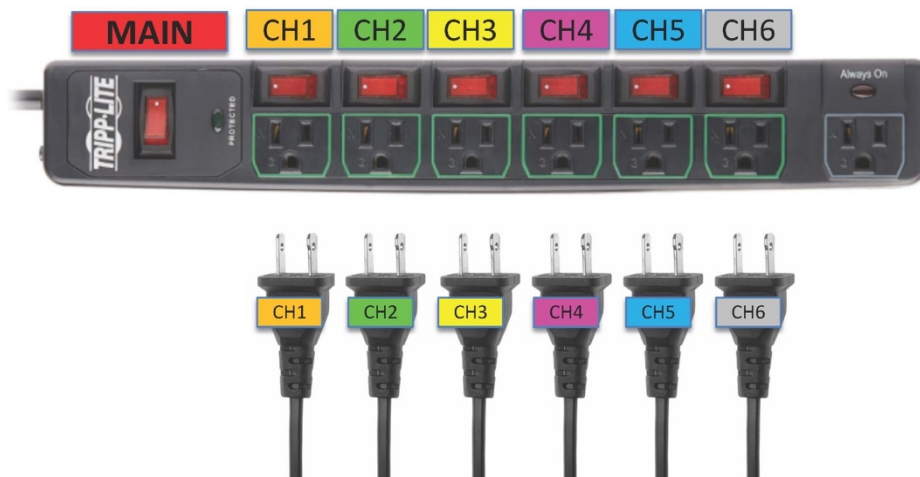


Figure 20: Lighting Kit Plan Version 1: Page 1

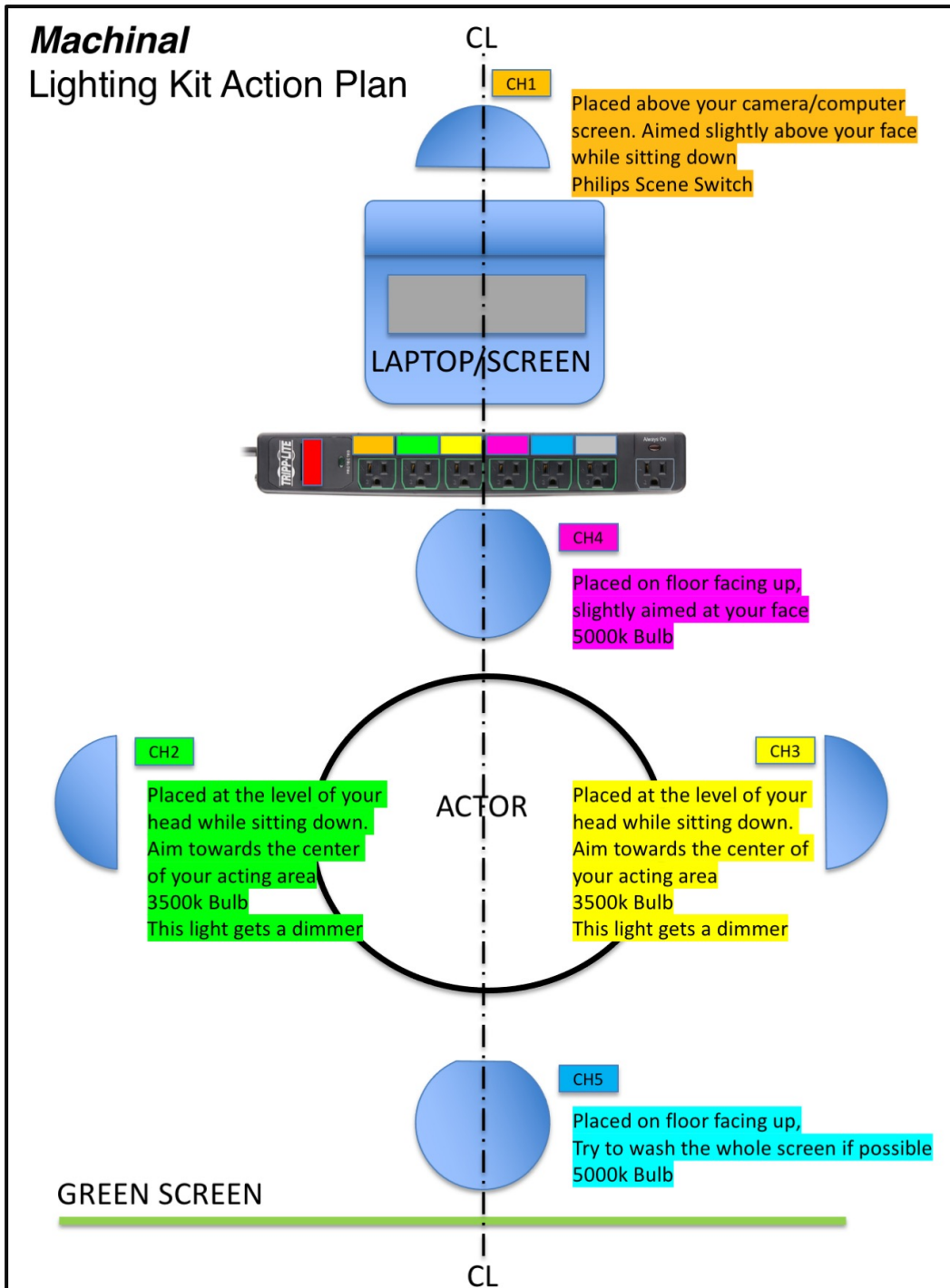


Figure 21: Lighting Kit Plan Version 1: Page 2



LIGHTING KIT PLAN
 UNIVERSITY OF MARYLAND
 TDPS: *MACHINAL* online
 LIGHTING DESIGNER: JACOB HUGHES
hughesjacob@hotmail.com
 469.867.2138

Version 1: 12/07/2020

Producing Company and Billing Info:
 University of Maryland:
 School of Theater, Dance,
 and Performance Studies
 8270 Alumni Dr. College Park, MD 20742

Venue:
 Via Zoom

Date:
 Jan 18th 2021

ACTOR	5' Extension	10' Extension	Short Stand	Tall Stand
Principle Cast				
Ebie Prideaux (Young Woman)	2	2		2
Bill Kassay (Husband/Boss)		2		
Logan Stevens (Lover)	1	1		2
Kelsey Diggs (Mother)	2			2
Actors with Multiple Roles				
Max Abramovitz		2	2	
Isabella Benning		1	2	
Jayson Borenstein (Didn't make an appointment)	2		2	
Leilani Clendeni	2			2
Yanna "Yani" Hill	2			1
Kayleigh Gallagher	1	1	1	
Sam Intrater	1		1	
Abigail Landesman	2		1	
Madeline Lomvardias	1	2	2	
Bardia Memar	2	2 (1 one them 3 prong)		2
Lisa Meyerovich	1	1	1	
Olesia Odle	2		1	
Mary Poorman	1		2	
Katie Rees (Didn't make an appointment)	2		2	
Beth Rendely	2	1- 3 prong		2
TOTAL	26	14	17	13

NOTE: THIS DOCUMENT IS NOT A FULL RENTAL LIST. IT IS EXPECTED THE SHOP WILL ADD THINGS NEEDED TO MAKE A COMPLETE WORKING SYSTEM. THIS INCLUDES ALL RIGGING PIECES.

Figure 22: Equipment Request List: Who receives additional gear

Chapter 3: Filming and the Virtual Rehearsal Process

3.1: Virtual Rehearsals: Tech Blocking

Devin and I worked with Brian, Fraser, and Maria De Barros, the show's stage-manager, on creating a rehearsal schedule and rhythm for us to attend the zoom rehearsal to collaborate on blocking and lighting. Maria and Devin coined the term "tech blocking" because of how Media was driving the virtual movement of the actor's bodies on the screen. At the end of the first week of tech blocking, the design team felt the show was going to be presented in black and white, but it was never discussed and official until this moment of overlaying the actors on the scenic renderings (Figure 23).

Devin and I quickly learned that Isadora's chroma key abilities were sensitive to small highlights and shadows compared to the zoom chroma keying tested before. At this point in the process, with limited electricians' aid and resource, I tried sending out additional lighting to performers in the area who could do additional gear pick-ups. Devin and I were struggling to balance camera settings, and the variety of environmental factors that were unique to each actor. Several feeds from performers were rough and occasionally gritty. As we progressed in the tech blocking process, I had to give up my idea of single-source lighting on the actors for the sake of chroma keying and keeping the camera exposure stable. Towards the end of the 3rd week of rehearsal, I sent the lead actress my softbox to evenly illuminate her and the green screen. Once I did that, I lost my ability to control her lighting. With media being the driving force, Devin offered to aid my dilemma with overlaying shadows in scenes as we progressed into tech.

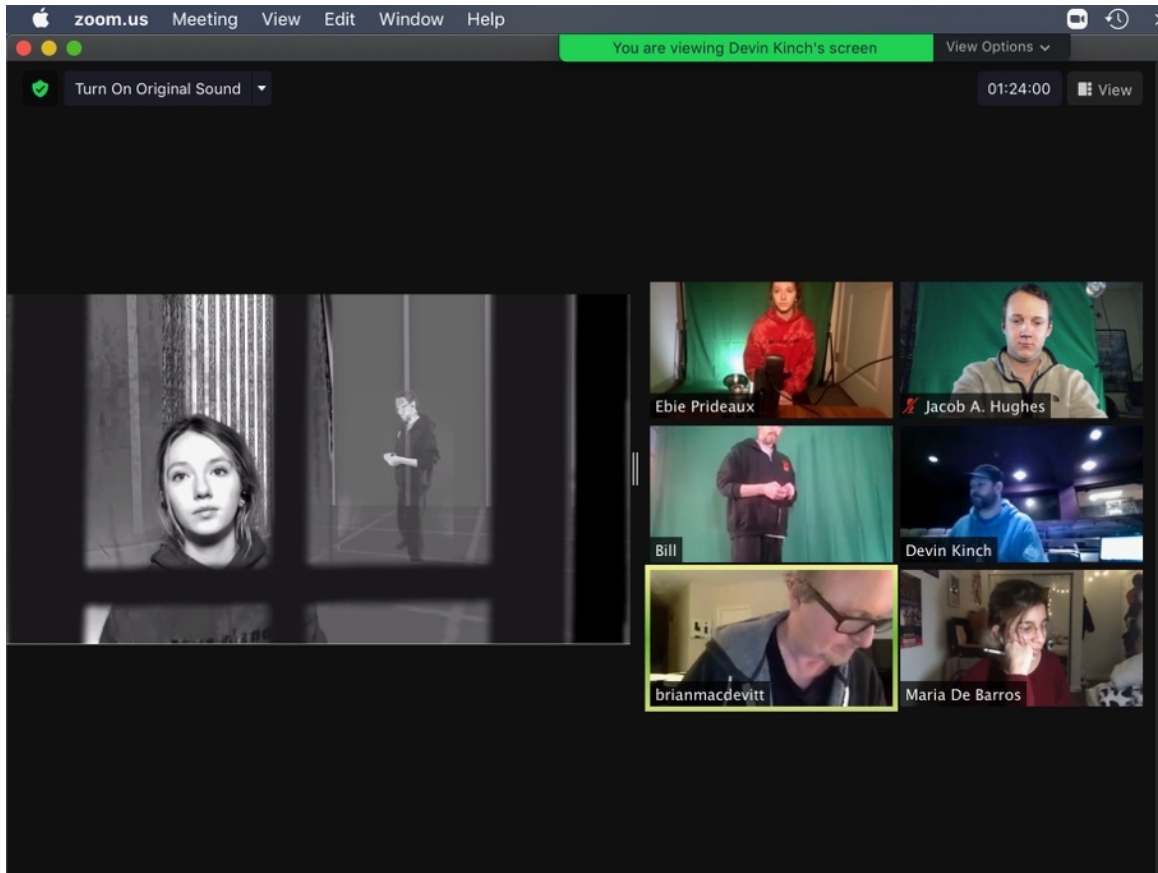


Figure 23: Zoom Tech Blocking, on the left is the video content Devin Kinch would assemble, on the right is the zoom camera feeds

3.2: Day One Filming

The design team and stage manager worked together in creating a list of video shots we needed to prerecord for the virtual show. For all of us involved, the filming days were the most exciting because it was the first time in a long time for most of us to work with people in a theater. Devin and Rochele led the filming because they were the most in sync and knowledgeable on the props and filming list. I lit the objects from a single source to recreate those film noir light and dark images. Occasionally I needed to add a second light to reveal the prop better. For example, glass bowls were a tad difficult because we used a black background the object did not show up in the stills. Towards the end of the first filming day, we moved into filming scene changes and capturing model snapshots with lighting. With the model's end product being in black and white, I worried less about colored lighting on the model. I tried controlling and pushing the differences in the lighting values with saturate colors and then on a separate camera reviewing the black and white end product's quality (Figure 24). Trying to use what Devin and Brian blocked into the show already, Devin encouraged filming a few lighting cues changes on the model that he would add to the media cues to give the illusion that the actors are in a world with changing light. In Episode One: Business, The Boss's door opens up, and the light casts across the model's downstage portion. This live lighting cue sparked interest in me, wanting to add more moments like this to the play. Day One's filming time ended, giving the media and lighting team a list of notes.



Figure 24: Image taken from the model recording

3.3: Day Two Filming

On the second filming day, we had graduate dancer Amber Daniels and her partner, Ricky Watson, to play the Young Woman and the Man performing a dancing duet. The plan was to record the intimate dance between the couple, then superimposing a flower and dancers' imagery on top of the young woman and the Man in the virtual space. From a previous meeting with Brian, Kendra, Rochele, and Devin, we discussed using a solid muslin for the dancer to perform on. During the filming, I would play with the light's position and distribution and bounce off ideas for adjustments with Devin and Brian. Devin could get a few versions of the duet to review and edit for Episode Six: Intimate moment. We experimented with camera position, lighting positions, and performer placement to record more B-roll video content throughout the day (Figure 26 and 27). The end goal of the day was to record the show's final moments, with the Young Woman walking up into a vast ether and blinding light. This moment I was waiting for since the planning of the filming in the Kay Theatre. Using a single light source, a fog machine, and a rear projection screen, we successfully recorded several takes of the show's end. Achieving something pure and straightforward, the Director proposed to the team half a year ago (Figure 25).



Figure 25: Amber Daniels walking up a staircases into fog while shedding a robe.



Figure 26: Recording for a conga line to be used to transition between Episode Two and Three.



Figure 27: Jacob Hughes determining placement of the fog tube.

Chapter 4: Tech Process of the Virtual Show

4.1 Week Before Tech

The week before tech week, a terrible thought crossed my mind. I was giving my THET116 class a lecture on the elements of design. In my course, I have a slide that discusses value, the relative lightness or darkness of an object. On that slide is an image of a woman in makeup comparing what colors of makeup change the value on an actor's face, and the thought "What if the makeup makes things worse?" crossed my mind. After weeks of battling highlights with the chroma key, I raised my concerns with Madison Booth on how I was having trouble balancing actors with very fair or oily skin in the tech blocking process. I asked her to test the makeup with what we've been doing on camera, and she was all for it. With covid safety and how close she would need to be to a person, I was the test subject since we already live together (Figure 28 through 31). Doing this test was very informative on how easily makeup manipulates lighting by changing the actor's skin's value. This became a tool for us to use in cleaning up camera and lighting issues.



Figure 28: Makeup Test



Figure 29: Makeup Test with underlighting.



Figure 30: Makeup Test with side lighting.



Figure 31: Makeup Test with front lighting.

4.2 Tech Process

During the technical week, I could not give my shop notes because of the time delay in getting gear to the actors. All of the cast members were safe at home streaming into the Kay Theatre (Figure 33). Each person had a unique living space that offered challenges, such as very few outlets, very little performance space, or bright green walls. Working with each actor on setting up their performance space was an interesting experience. The performer and I troubleshoot shadows and discussed how to light their screen better. I took note of the paint color in people's rooms and bounced light to soften a few of my front lights. My lighting kit plan was not perfect for every room set up and in the middle of the technical rehearsal process, I adjusted the lighting kit set up for a handful of actors so that Devin could better chroma key the screen (Figure 32). Lighting and Media for this show invaded their personal spaces, and I thank the actors who were willing to share pictures of their rooms (Figure 34 through 39). I recommended the actors install a program called Logitech Ghub, so Devin and I could better manipulate the camera's exposure to see the performers and have a stable green screen for chroma keying. I worked one on one with each performer adjusting their camera settings and overall room intensity while Devin cleared up the chroma keying in Isadora.

We discovered it was better to sit in the theater with Devin, so our conversations as a team happened in real-time without the frustrations of Zoom. Devin projected the actor's feed onto the Kay Theatre's fire curtain, then overlay the actor's camera feed on a test pattern for us to see how successful the actor was being keyed out from the green screen. I manipulated the exposure, contrast, and saturation to accommodate the lighting and chroma keying better. The settings changed day to

day because some actors took down their technical setups between rehearsals. At times Devin and I had over-exposure problems with too much lighting intensity on an actor's face. If I was not able to lower the level of the camera's lighting or exposure, I simply discussed with Madison about adjusting the value of the actor's makeup. She agreed and gave the note to the actor.

Everything was working out nicely until an unfortunate weather forecast. In the middle of the technical rehearsal process, we lost a day and a half to snow closures. At this point in the tech process, we had significant audio lag between the actors, which slowed the pacing of the show. Roc Lee was simply a few hours away from cracking the audio issue, but with the lost time the show was not ready to open. The School of Theatre, Dance, and Performance Studies decided to delay the opening of *Machinal* and host a zoom performance of the show for the cast's friends and family. *Machinal*'s opening was delayed by another week to troubleshoot the audio delays. After much help from our Director of the School of Theatre and production manager the show open on February 28th, 2021. It was a satisfying moment to have completed a research in performance project after the amount of show cancelations the theater industry experienced in 2020.

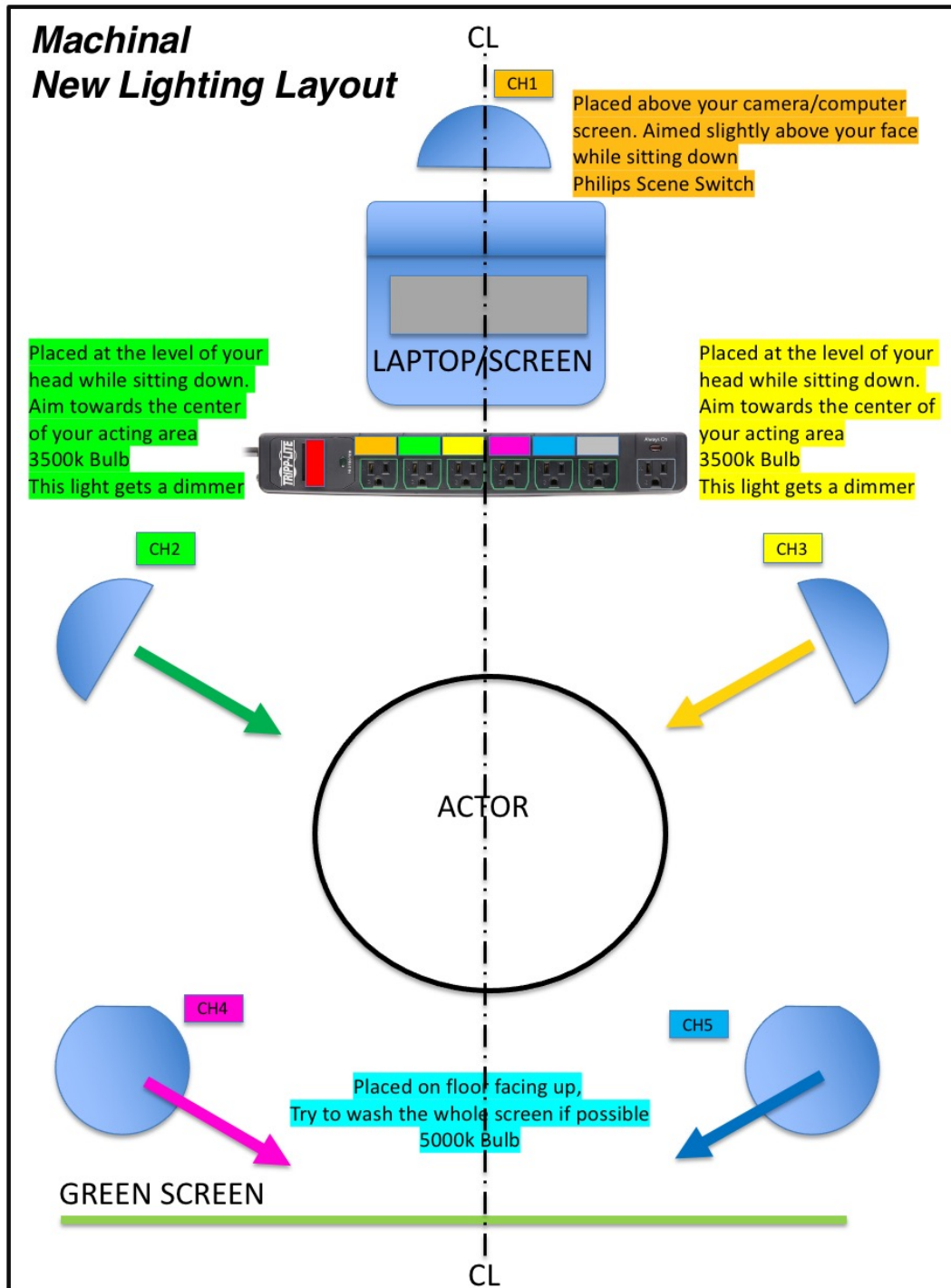


Figure 32: New Lighting layout for select cast members with a short range between the camera and green screen.



Figure 33: Tech Process: Back in the Theater!



Figure 34: Invading the Personal Space; actor's performance space in the home's common area.

MACHINAL IN HOME LIGHTING SET UP



Figure 35: Invading the Personal Space; Adjustments to the lighting were made during the technical process, performers had to adapt to what we could clip the lights to.

MACHINAL IN HOME LIGHTING SET UP



Figure 36: Invading the Personal Space; tight spaces were a challenge when dealing with shadows on the green screen.

MACHINAL IN HOME LIGHTING SET UP



Figure 37: Invading the Personal Space; Another setup

MACHINAL IN HOME LIGHTING SET UP



Figure 38: Invading the Personal Space; the power strip had to be near the performer's acting area for scene changes in the original plan.



Figure 39: Invading the Personal Space; Drawers were used for clipping lights on to quite often because of their height and how most performers were streaming from their bedrooms.

Chapter 5: Production Images



Figure 40: Dress Rehearsal Run Through; Episode One: To Business



Figure 41: Dress Rehearsal Run Through; Episode Six: Intimate



Figure 42: Dress Rehearsal Run Through; Episode Seven: Domestic.



Figure 43: Dress Rehearsal Run Through; Episode Eight: The Law



Figure 44: Dress Rehearsal Run Through; Episode Nine: A Machine



Figure 45: Dress Rehearsal Run Through; Into the Ether

Chapter 6: Final Reflection and Continued Research

Watching the first and final *Machinal* performance was an exciting experience. Having a break between the last tech rehearsal to the opening of the show freshened my mind and made the performance much more engaging and enjoyable. Reviewing the show, it was something new the school has not produced before, and I felt it was successful at being the first of its kind, a live cinema performance. Having this show under my belt, I think I could take on another live stream show being much more knowledgeable on how to achieve the end product so I can focus more on artistry at the moment. The biggest struggle for this show was not having enough technical time. We lost days of technical rehearsal to snow. There also was a delay in getting the media and lighting kits to the performers because of COVID. These were some of the challenges thrown at us that the team had no control over.

There were many challenges for me with the change to the virtual platform. The first major challenge was using new tools on a platform I never worked with before. Looking back now, I would have product-tested with more film gear and web conferencing lighting. Media was the driving force behind *Machinal*. With the audience watching live from a screen, I felt technology became a factor in everything and that I lost a lot of my ability to have lighting artistry in the show. I wanted to create more moments of live lighting changes on the model. However, that was not doable with the amount of work Devin was already doing. After *Machinal* closed, I discovered a type of reflective fabric that could have been the solution to many video and lighting problems with the show. Knowing what I know now, I feel better equipped to do another live cinema performance.

I'm thankful for being able to work with the designers on this show. We got to explore new things and experiment with using unconventional stagecraft ideas. Devin and I, at times, had disagreements when planning the staged version of *Machinal*, but with the pandemic and excitement to explore something new, we worked better together and developed a language that I have never done with a media designer before. Madison was great to work with, and I'm glad we were able to experiment together, which generally I do not do; at some point, she trusted me to give the actors makeup notes if it aided lighting. When the show moved to the live stream format Rochele and I would work together on lighting the ½" model. We discovered a lot with miniature lights and the MANY ways to make a scale fluorescent tube light up. Brian MacDevitt is a rare director to work with. Not many directors allow the design team to dictate and fully control the world of the play as he did. Brian placed a lot of trust in us from the get-go in accomplishing this work, and he made sure to keep theatricality in the show and maintain its engagement scene to scene.

With how the year 2020 played out, I'm thankful that the *Machinal* team and the School of Theatre, Dance, and Performance Studies' pushed through the challenges to explore a new style of performance. I would personally like to chime in and say, "Technically, it was Avant-Garde!" The design team and cast accomplished a marathon in the middle of a pandemic, and even though we might have stumbled, we discovered ourselves and learned many new things. Though the show was not 100% complete to every detail the team wanted and dreamed of, it was amazing to have the work showcased to the public and not canceled like other parts of our season.

Bibliography

Production photos: David Andrews, courtesy of The University of Maryland.

Production Photos, Model Photos, and Scenic Renderings: Rochele Mac.